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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/659,235	09/11/2000	William O'Leary	100.136US01	4655

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EXAMINER

BUTLER, DENNIS

ART UNIT	PAPER NUMBER
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2185

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/659,235

Applicant(s)

O'LEARY, WILLIAM

Examiner

Dennis M. Butler

Art Unit

2185

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 September 2000.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25,32,42 and 45 is/are allowed.
- 6) ☒ Claim(s) 1-24,26-31,33-41,43 and 44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 September 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

1. This action is in response to the application filed on September 11, 2000. Claims 1-45 are pending.
2. The drawings are objected to because they do not show all of the claimed features including a phase detector that is a two-state phase detector that uses XOR logic, a phase detector that is a two-state phase detector that is a sequential phase detector and a phase detector that is a three-state phase detector as recited in the claims.
3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5, 10-14, 19-22, 26-31 and 43-44 are rejected under 35 U.S.C. 102(b) as being anticipated by McCauley, U. S. Patent 4,847,678.

Per claims 1, 10, 26, 31 and 43:

A) McCauley teaches the following claimed items:

1. a phase detector generating an error signal with Phase detector 48 of figure 2 and at column 5, lines 1-25;

2. a digital counter generating a count value indicating the amount of phase error with Up/Down Counter 52 of figure 2, at column 5, lines 12-25 and 56-61, with figure 7 and at column 7, lines 47-62;
3. a digital to analog converter converting the count value to an error voltage with D/A converter 62 of figures 2 and 8, at column 5, lines 56-61 and at column 7, line 63 – column 8, line 1;
4. a filter that filters the error voltage with the low pass filter including op amp 131 and the attached resistors and capacitor in figure 8 and at column 8, lines 1-11;
5. a voltage controlled oscillator with VCO 34 of figures 2 and 8, at column 5, lines 56-61 and at column 8, lines 12-56.

Per claims 2-5, 11-14 and 27:

McCauley teaches a sequential two-state phase detector that has XOR logic with the circuit comprising XOR gate 102 and the phase error output of figure 3. McCauley teaches a three-state phase detector with the circuit comprising XOR gate 102, XOR gate 82, the phase error output and the phase sign output of figure 3.

Per claim 19:

McCauley teaches the filter comprising an active filter with the low pass filter including op amp 131 and the attached resistors and capacitor in figure 8 and at column 8, lines 1-11.

Per claims 20-22, 29 and 30:

McCauley teaches that the voltage controlled oscillator (VCO) is a crystal oscillator and outputs a feedback signal to a frequency divider with crystal 132 of figure 8, divider 64 of figure 2 at column 5, lines 56-68 and at column 8, lines 12-56.

Per claims 28 and 44:

McCauley teaches incrementing the digital counter in response to a sampling clock (phase error signal), setting the counter to an initial value, incrementing in response to phase lead and decrementing in response to phase lag with figures 2 and 7, at column 5, lines 12-25 and 56-61 and at column 7, lines 47-62.

6. Claims 6-9, 15-18, 23-24 and 33-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCauley, U. S. Patent 4,847,678 in view of Takeuchi, U. S. Patent 5,727,193.

Claims 23-24 seem to differ from McCauley in that McCauley fails to explicitly teach providing a frequency divider for dividing the reference signal and inputting the divided reference signal into the phase detector as claimed. However, Takeuchi describes that it is known to provide a frequency divider for dividing the reference signal and inputting the divided reference signal into the phase detector with frequency divider 27 of figure 2 at column 3, line 43 – column 4, line 9. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a frequency divider for dividing the reference signal and inputting the divided reference signal into the phase

detector, as taught by Takeuchi, in order to increase the flexibility of the phase detecting and locking circuitry by allowing a greater number of possible reference signals and/or frequencies to be applied to the system and provide the ability to generate a fractional speed clock signal. One of ordinary skill in the art would have been motivated to combine McCauley and Takeuchi because of Takeuchi's suggestion at column 4, lines 45-51. It would have been obvious for one of ordinary skill in the art to combine McCauley and Takeuchi because they are both directed to the problem of generating a signal that is synchronized to a reference signal using a phase locked loop. Claims 33 and 40 are similar in scope and content to claims 10, 11, 19, 22 and 23 and are rejected for the same reasons as these claims. Claims 34-39 and 41 are similar in scope and content to claims 12, 13, 15, 20, 22 and 24 and are rejected for the same reasons as these claims. Claims 6-9 and 15-18 recite obvious variations of well known timing and synchronization procedures and circuitry and would have been obvious in view of the teachings and suggestions of McCauley and Takeuchi.

7. Claims 25, 32, 42 and 45 are allowable over the art of record because the art of record does not teach or suggest the combination of recited elements.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis M. Butler whose telephone number is 703-305-

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9663. The fax phone number for the organization where this application or proceeding is assigned is 703-746-7239.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

*Dennis M. Butler*  
Dennis M. Butler  
Primary Examiner  
Art Unit 2185